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## Current Support Brief

### SOVIET AND HUNGARIAN DEVELOPMENT OF A NEW HIGH-CAPACITY MICROWAVE SYSTEM



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SOVIET AND HUNGARIAN DEVELOPMENT  
OF A NEW HIGH-CAPACITY MICROWAVE SYSTEM

The USSR and Hungary have completed the design of a new high-capacity microwave system, designated "Druzhba," that will have the capability to transmit more than 10,000 telephone channels plus television for distances of up to 6,000 miles. 1/ This capability represents three times the channel capacity and two times the distance capability of the most advanced microwave systems currently in use in the Soviet Bloc. Although publicized as original and unique, a comparable system has been used in the US since 1961. Hungary will have production responsibility for this system, with prototype production scheduled for 1965 and series production to begin in 1969. Experimental circuits totaling some 260 miles are to be constructed in the USSR in 1966-67, and the first series production units are to be installed in the USSR, probably beginning in 1970. 2/

The development of the "Druzhba" system by Hungary is a logical extension of existing microwave technology to accommodate anticipated requirements for more interurban channel capacity in the USSR and the European Satellites in the period following 1970. The assignment of production responsibility to Hungary for this system is an outgrowth of earlier Hungarian-Soviet successes in the joint development of high-capacity microwave equipment. It also may be an indication that the USSR wishes to shift at least some of its civilian requirements for production of microwave equipment to Hungary to alleviate strains imposed on some facilities of its own electronics industry by military requirements for specialized microwave equipment.

1. Production, Technology, and Export

The Orion plant in Budapest has been assigned the principal production responsibility for the "Druzhba" system, with prototype production scheduled to begin in 1965. Equipment for a 90-mile experimental line in the USSR, probably from Moscow to Vladimir, is to be provided in 1966. In 1967 this line is to be extended 170 miles, probably from Vladimir to Gor'kiy. By 1969 the Orion plant plans to begin series production, with planned annual output of US \$12 million to \$15 million. 3/ This annual output should be sufficient to equip from 1,200 to 1,800 route miles of "Druzhba" with three radio-frequency (RF) trunks, exclusive of multiplexing equipment.

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Most of the initial production will be exported to the USSR. The USSR has been importing microwave equipment from Hungary in modest quantities since at least 1958, including the PM-24, the PM-28, and the GTT-4000/600 types. The addition of "Druzhba" should increase the value of Hungarian exports of microwave equipment to the USSR from the level of about \$4 million in 1960 to an estimated level of \$25 million to \$30 million by 1970. 4/

The development of the "Druzhba" equipment is the second major cooperative effort between Hungary and the USSR in advanced microwave technology. During the period 1957-61 the USSR gave substantial technical and financial assistance to Hungary for the development of the GTT-4000/600 (the counterpart to the Soviet VESNA), a broad-band system operating in the 4 gigacycle (gcs) frequency range that has a capacity of 600 telephone channels or 1 television channel on each of 6 RF trunks. The rapid strides made by Hungary in microwave technology complement Soviet requirements and relieve the USSR of the need to impose additional burdens on its burgeoning electronics industry.

## 2. Analogy to US Microwave Development

The new "Druzhba" microwave system is comparable to a US system, the Bell Telephone "TH," that was put into operational use in 1961. Both systems provide for six to eight broad-band RF trunks operating in the radio-frequency range of 6 gcs. The "Druzhba" will differ, however, in that it reportedly will provide for a slightly greater number of telephone channels per RF trunk -- 1,920 telephone channels compared with 1,860 for the "TH" -- and, for the most part, will utilize semiconductors.

The Soviet Bloc consistently has lagged behind the US in developments in civilian communications, notably in coaxial cable and 4-gcs microwave systems. This lag stems from technological shortcomings as well as from a difference in end-use orientation. Consumer-oriented end use in the US versus government-oriented end use in the Soviet Bloc have produced different stimuli as well as requirements for the development of modern high-capacity communications systems.

## 3. Prospects

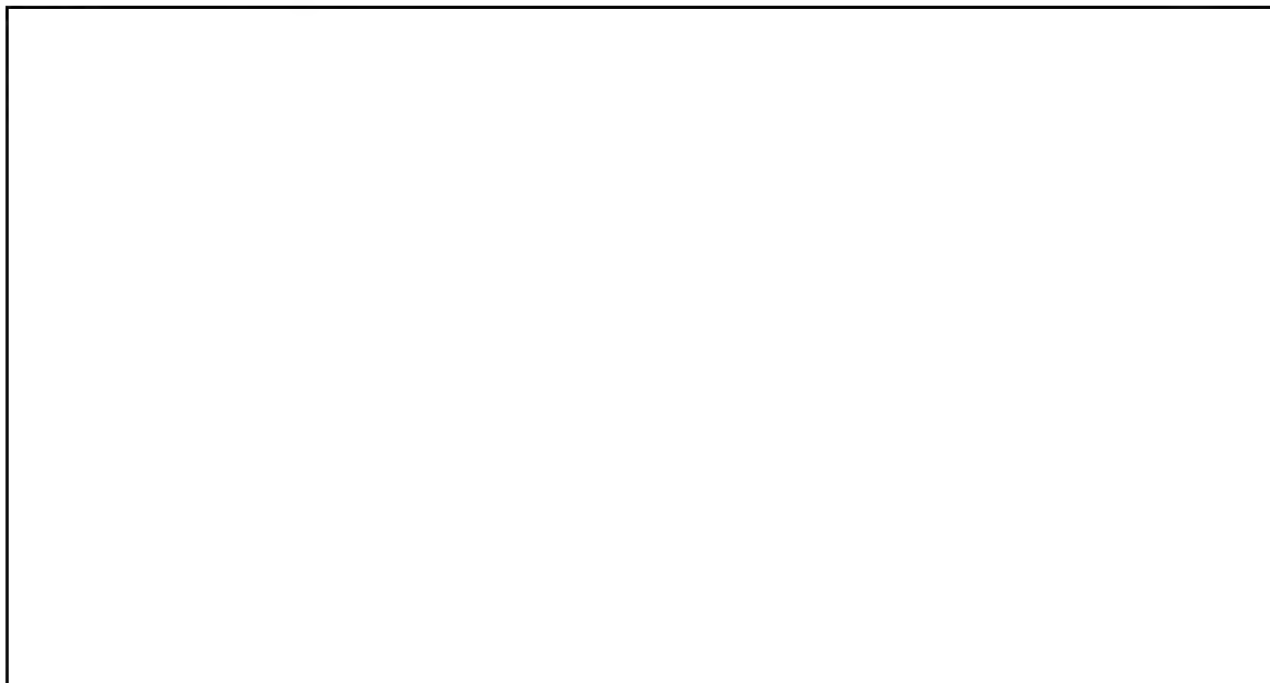
Existing, operational, and planned microwave and coaxial cable systems in the USSR and the European Satellites currently have sufficient

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potential for the expansion of channel capacity to meet most of the planned requirements of the Soviet Bloc through 1970. After 1970, interurban channel requirements will expand rapidly as Soviet Bloc plans for increased telephone capacity, an expanded television network, and a large complex of computer centers in the USSR are developed. Deployment of the "Druzhba" system will be consistent with these long-term requirements. Long-standing problems in production of carrier-frequency multiplexing equipment may persist beyond 1970, however, and restrict the exploitation of this new microwave system to less than its full potential.

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2 October 1964

MEMORANDUM FOR: Chief, Dissemination Control Branch, DD/CR  
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SUBJECT : Transmittal of Material

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